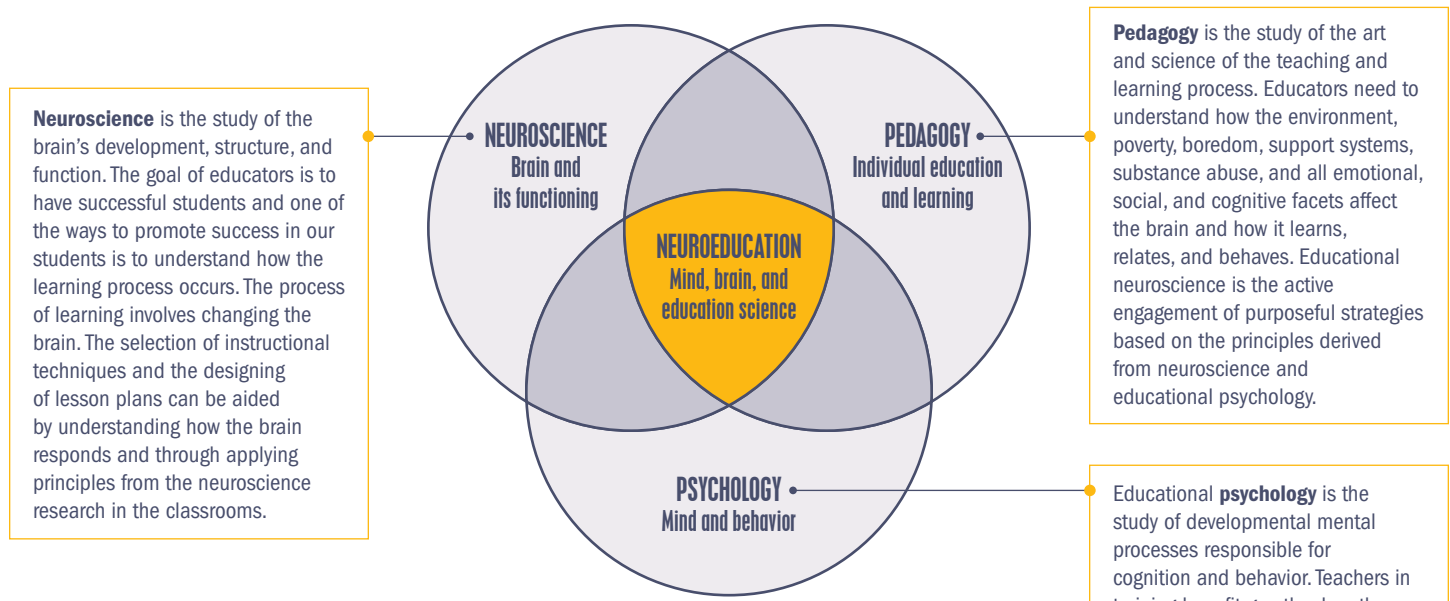


The Three Disciplines of Educational Neuroscience

Educational neuroscience is the discipline that combines **neuroscience, pedagogy, and psychology** bringing the current research from how the brain learns, behaves, and relates to instructional practices in the classroom. Every class, assignment, and experience shapes the human brain. Understanding how the brain processes information into learning and knowing more about what it takes for students' brains to be engaged, responsive, and alert are fundamental to the teaching and learning process.



Within this discipline, pre-service teachers will understand how stress affects the brain's ability to process information and how to create and design instruction and engagement strategies so that we are addressing the critical emotional, social, and cognitive developmental stages in every classroom.

The Relationship Between Learning and the Brain

The brain is wired for novelty, patterns, questions, relationships, and survival. When we instruct our students building on the impact of “connection” with one another, subject matter, and their own expertise “learning” feels relevant and meaningful and is sustained.

The implicit goal of all education is to change students’ brains, by improving both their knowledge base and their understanding of information they acquire.

Every class, assignment, and experience shapes the human brain. Understanding how the brain processes information into learning and how stress responses affect the developing executive functions in the brain, as well as knowing how to create capacity for maximal responsive student receptivity are critical to all subject areas and grade levels. Educational neuroscience is the active engagement of purposeful strategies based on principles derived from research in the above mentioned areas.

Five Research-Based Principles That We Know Affect Learning and Behaviors in the Classroom

- 1 Movement enhances learning and memory. Movement brings additional fuel-carrying blood to the brain. It allows the brain to access more long-term memory areas (an ancient survival strategy), thereby helping students make greater connections between new and prior learning. Exercise was shown to be strongly correlated with increases in brain mass and cell production, as well as improved cognitive functioning and mood regulation.
- 2 Emotions have a great impact on learning. Students cannot focus on the curriculum unless they feel physically safe and emotionally secure.
- 3 The varying pace of brain development helps to explain the behavior of children and adolescents.
- 4 The school’s social and cultural climates affect learning. A school’s culture is characterized by openness of communication, level of expectations and appreciation for effort, involvement in decision-making, and degree of caring.
- 5 Brains can grow new neurons in the hippocampus. The hippocampus encodes long term memory.

Sousa, David. (2010). *Mind, Brain, and Education, Neuroscience Implications for the Classroom*, Indiana: Solution Tree Press.